

WHAT IS CLAIMED IS:

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1. A Global Positioning System (GPS)-based positioning system, comprising:
    - (a) a GPS terminal, including:
      - (i) a GPS section for receiving and processing a GPS signal;
      - (ii) a strategy selector, external to and coupled to the GPS section, that determines a positioning strategy based upon a state of the GPS section; and
      - (iii) a communication system, coupled to the GPS section and the strategy selector, for transmitting and receiving data to and from a location aiding server, and
    - (b) a location aiding server, which communicates with the communications system of

the GPS terminal via a communications network, including:

- (i) an aiding data generation section for forming location aiding data; and
- (ii) a communication control section for transmitting data to and receiving data from the GPS terminal.

2. The system of claim 1, wherein the location aiding server calculates a position of the GPS terminal based upon data received from the GPS terminal.

3. The system of claim 1, wherein the strategy selector comprises a mode determinator for determining a mode of operation of the GPS section based upon the state of the GPS section.

4. The system of claim 3, wherein the state of the GPS section is determined by at least one parameter selected from a group comprising: a signal level of received satellite signals, a number of satellites from which signals are being received, a frequency range used for searching for satellites, a time range used for searching for satellites, a current searching status, and a state in a positioning process sequence.

5. The system of claim 3, further comprising a time estimator for computing an estimated positioning time based upon the state of the GPS section, wherein the mode determinator determines the mode of operation of the GPS section based upon computed estimated positioning time.

6. The system of claim 3, wherein the mode determinator determines the mode of operation by using at least one parameter selected from a group comprising: a communication state of the communications network between the GPS terminal and the location aiding server, a communications cost, and a user request, wherein the user request is at least one request selected from a group comprising: positioning accuracy, positioning time, positioning costs, and positioning sensitivity.

7. The system of claim 6, wherein the communication state is determined by at least one parameter selected from a group comprising: an availability of a communication link to the location aiding server, an effective data transmission rate between the GPS terminal and the location aiding server, and a communication delay characteristic between the GPS terminal and the location aiding server.

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8. The system of claim 3, wherein the GPS terminal further comprises a terminal destination calculator for selecting a destination of a terminal calculated position of the GPS terminal and for sending the position, and wherein the location aiding server further comprises a server destination calculator for selecting a destination of a server calculated position of the GPS terminal and for sending a server calculated position of the GPS terminal.

9. The system of claim 8, wherein the destination of the calculated position of the GPS terminal is shared between the GPS terminal and the location aiding server.

10. The system of claim 1, wherein the strategy selector comprises an aiding data determinator for determining a method for acquiring position aiding data based upon the state of the GPS section.

11. The system of claim 10, wherein the state of the GPS section is determined by at least one parameter selected from a group comprising a signal level of received satellite signals, a number of satellites from which signals are being received, a frequency range used for searching for satellites, a time range used for searching for satellites, a current searching status, and a state in a positioning process sequence.

20 12. The system of claim 10, further comprising a time estimator for computing an estimated positioning time based upon the state of the GPS section, wherein the aiding data determinator determines the acquiring method based upon the computed estimated positioning time.

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13. The system of claim 10, wherein the aiding data determinator determines the acquiring method based on at least one parameter selected from a group comprising: a communication state of the communications network between the GPS terminal and the location aiding server, a communications cost, and a user request, wherein the user request is at least one request selected from a group comprising: positioning accuracy, positioning time, positioning costs, and positioning sensitivity.
14. The system of claim 13, wherein the communication state of the network is determined by at least one parameter selected from a group comprising: an availability of a communication link to the location aiding server, an effective data transmission rate of the network and a communication delay characteristic of the network,
15. The system of claim 10, wherein the GPS terminal further comprises a terminal destination calculator for selecting a destination for the GPS terminal and for sending a terminal calculated position of the GPS terminal, and wherein the location aiding server further comprises a server destination calculator for selecting a destination for the GPS terminal and for sending a server calculated position of the GPS terminal.
- 20 16. The system of claim 15, wherein at least one of the server calculated position and the terminal calculated position of the GPS terminal is shared between the GPS terminal and the location aiding server.

17. The system of claim 10, wherein the aiding data being sent from the aiding data determinator to the GPS section is dynamically altered based on a change in the state of the GPS section.

5 18. The system of claim 1, wherein the GPS section and the strategy selector pass information between the GPS section and the strategy selector.

19. The system of claim 18, wherein the information is selected from a group comprising real time data of the GPS section and a quality of service message.

20. The system of claim 19, wherein the quality of service message is at least one message selected from a group comprising: a request or estimated positioning accuracy, a request or estimated positioning time, a request or estimated positioning sensitivity, or information for the necessity of aiding data, and a preferred mode of operation.

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21. ✓ A GPS terminal comprising:

a GPS section for receiving and processing a GPS signal;

a strategy selector, external to and coupled to the GPS section, that determines a positioning

strategy based upon a state of the GPS section.